

REMARKS

The two-way election requirement involving article claims 1 to 10 and method claims 11 to 12 and applicant's election of the former is acknowledged. Non-elected claims 11 and 12 have been canceled to advance prosecution. Applicant will rely upon the protections afforded by 35 USC 121 for any divisional application that may be filed.

Claims 5 and 10 have been rewritten as new claims 13 and 14, respectively which claims are believed to overcome both the rejection under the second paragraph of 35 USC 112 and the rejection 35 USC 101. Support for the new claims is found in the specification at page 12, line 29 to page 13, line 19.

The claims before the Examiner for consideration are claims 1 to 4, 6 to 9, 13, and 14.

The rejection of claims 1 to 10 under 35 USC 102 or 35 USC 103 over Shiotani et al. '598 is respectfully traversed.

The Examiner asserts that the reference discloses a polyimide/metal composite containing a polyimide substrate film, thin film plastic polyimide coat and a metal foil. The Examiner acknowledges that the storage modulus feature of the present claims is not shown in the reference. The Examiner, however, asserts that because there is a melting of the thermoplastic polyimide in Shiotani et al. '598. The melt is deemed to have the claimed storage modulus unless shown

otherwise. The Examiner further states that even if no storage modulus is shown, it would have been obvious to a person of ordinary skill in the art "to use thermoplastic polyimide having low melt viscosity to flow and fill in rough surface of metal foil to provide good adhesion."

Applicant respectfully submits that the reference neither teaches nor suggests the claimed invention because as the Examiner recognizes, there is no mention in the patent of storage modulus of any type or its relationship to glass transition temperature or the values recited in the claims. Applicant points out in the instant disclosure at page 5, line 5 et seq. that the present invention is based on the discovery that the storage modulus at at least the glass transition temperature is an important factor for unexpected improvement of adhesive strength between a metal layer and an insulating layer. In other words, the inventor has found that the influence of the visco elastic behavior, particularly a storage modulus of at least a temperature the glass transition temperature at the contact bonding temperature is much more important in terms of adhesive strength between a metal layer and an insulating layer than the composition of the resin to be used. Such a discovery means that even if the contact bonding is carried out at a temperature of at least the glass

transition temperature there is no guarantee of obtaining sufficient adhesive strength required in a specific technology field such as very sophisticated hard discs being incorporated into personal computers. (The invention is designed to give improved bonding in such applications; see page 3, line 27 to page 4, line 14 of the specification.) Applicant found further that resins having a maximum storage modulus value of 10^6 Pa at or above the glass transition temperature of the resin provide good adhesion to a metal layer independently of the resin composition itself. The reference is silent regarding any of these discoveries.

The record, moreover, contains evidence of the patentability of the claimed invention and the Examiner is directed to the Comparative Examples in Table 1 and Fig. 4. The Comparative Data show the unexpected results that even if the contact bonding is carried out at a temperature of at least the glass transition temperature, the adhesive strength becomes poor in those instances where the minimum storage modulus is greater than 10^6 Pa regardless of the resin compositions. There is nothing in the reference about looking to storage modulus values for anything, let alone improved adhesion. The patent has no recognition or awareness of the interplay between glass transition temperature and storage

Serial No. 09/835,080

modulus or any minimum value of the latter. Lastly, there is no recognition or awareness, as proved by applicant here, that the storage modulus value is a result effective variable. The rejection should be withdrawn.

The Examiner is thanked for acknowledging receipt of the priority document and for providing a PTO 948.

In view of the foregoing revisions and remarks, it is respectfully submitted that the claims are in condition for allowance and a USPTO paper to those ends is earnestly solicited.

Serial No. 09/835,080

The Examiner is requested to telephone the undersigned if additional changes are required in the case prior to allowance.

Respectfully submitted,

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